STUDIES IN THE HAWAIIAN RUTACEAE, III : ON THE NEW CALEDONIAN SPECIES OF « PELEA », AND A MISUNDERSTOOD SPECIES OF « PLATYDESMA »

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Résumé : Guillaumin a décrit deux plantes néocalédoniennes sous les noms de *Pelea fulva* et *P. lielaensis;* or le genre *Pelea* est représenté par des espèces dont la majorité sont endémiques aux Hawaï et 2 seulement, d'ailleurs imparfaitement connues, aux Marquises.

On ne connait pas le fruit de *Pelea fulva* mais celui de *P. lielaensis* est une capsule à quatre carpelles distincts alors qu'ils sont soudés chez les *Pelea;* aussi les *Pelea fulva* et *P. lielaensis* doivent être considérés plutôt comme appartenant au genre *Melicope*, d'où les combinaisons nouvelles *Melicope fulva* (Guill.) Stone et *M. lielaensis* (Guill.) Stone.

In 1938, Prof. A Guillaumin described two species of *Pelea* from the island of New Caledonia, naming them *Pelea fulva* and *P. lielaensis.*

Through the courtesy of the Museum d'Histoire Naturelle of Paris I have been able to study isotypes of these specimens; and an isotype of *P. fulva* is at hand from Kew. During the course of monographic studies of *Pelea* and comparative studies of related genera, it has become apparent that the closest relatives are the genera *Melicope* and *Acronychia*. *Pelea* as now interpreted is a genus restricted to the Hawaiian and Marquesas Islands. The great majority of the species are endemic to the Hawaiian group, and only two — and these imperfectly known — are from the Marquesas. Species of *Pelea* reported from elsewhere have since been found to belong in other genera. St. John demonstrated some years ago [2] that *Pelea madagascarica* was not a *Pelea*, but belonged in the genus *Humblotidendron* of Engler (which has since been treated as a synonym of *Vepris* by H. Perrier de la Bathie [3]), and A. C. Smith removed the dubious *Pelea*? *lucida* A. Gray to the genus *Melicope*[4]. Besides the two Marquesan species, *P. nukuhivensis* and *P. faluhivensis*, which were described by F. B. H. Brown[5], the only non-Hawaiian species still regarded as *Pelea* are the two New Caledonian species. The structure of the fruit is

1. Bull. Soc. Bot. France **85** : 302.
2. Notul. System. (Paris) **6** [3] : 125-129 (1937).
3. Flore de Madagascar et Comores, fam. 104 : 27, 34, 38 (1950).
4. Jour. Arnold. Arboretum **32** : 226-255 (1951).
5. Bull. Bishop Museum **130** : 127-129 (1935).

perhaps the most important single feature in distinguishing the genera *Pelea*, *Melicope*, and *Acronychia*. There are, however, additional features which are of diagnostic value. One of these features is the nature of the stigma; another is the form of the stamens. These features have generally been overlooked. In flowers of *Pelea*, the styles are coalesced and terminate in a thickened, minutely papillate stigma; the four stigmas are rotate or slightly ascending. The filaments of *Pelea* are flattened, tapered above, and merge indistinguishably with the relatively broad connective. Since the flowers of *Pelea* are either functionally pistillate or functionally male (or functionally perfect or incompletely perfect) both fertile and sterile stamens are found. The expansion of the connective is most evident in the sterile stamens, in which the abortive thecae are reduced to two lateral flanges.

A careful study of *Pelea fulva* and *Pelea lielaensis* shows that both are to be excluded from *Pelea*. In *P. fulva* (Pl. 1, A-M), which is characterized by its dense reddish-golden tomentum, complex inflorescences, and acuminate leaves, the flowers show erect, tapered stigmas, and the anthers are broad and the thecae scarcely separated. No fruiting material of this species has been seen. In *P. lielaensis*, which is distinguished by its glabrous character, 3-flowered cymose inflorescences, and small rounded leaves, flowers and fruits are available; and the fruit is seen to be an apocarpous 4-follicular capsule, that is, each carpel is distinct in fruit. The fruit illustrated here (fig. 2, P) consists of a single follicle; the other three aborted. As a result, the erect position is probably to be deduced, but in normal fruits, mutual growth pressures would probably result in a stellate or cruciate form, the follicles rotate or perhaps somewhat ascending. The flowers exhibit the erect stigmas; the stamens, which appear as a pair of quartets, the longer series apparently fertile, the shorter series apparently sterile, are more similar to the stamens of *Pelea* as typified by the Hawaiian species, than to those of *P. fulva*.

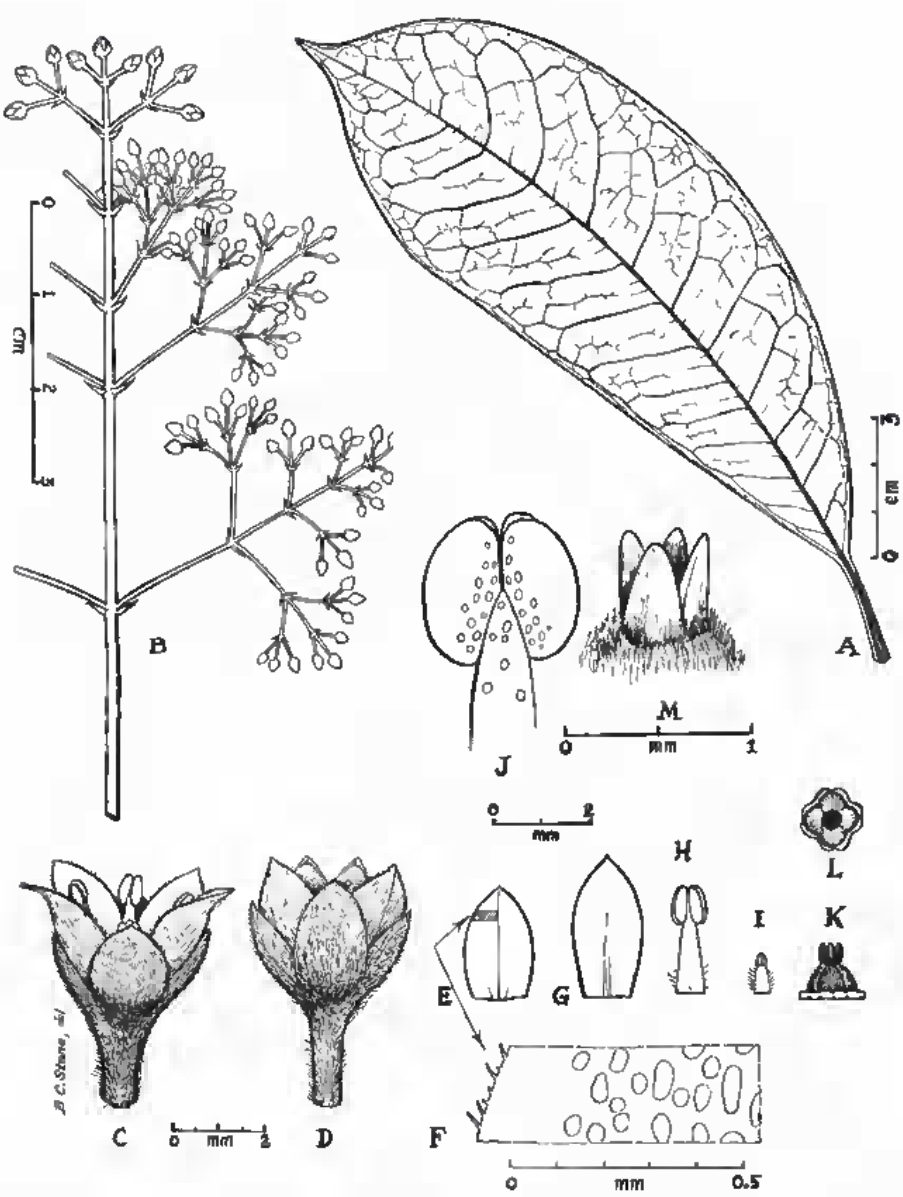
Apocarpous capsules occur in *Pelea;* they are found in species which constitute the section *Apocarpa* [6]. The other sections of *Pelea*, i. e. the typical one, sect. *Pelea*, *Cubicarpa* and *Megacarpa*, consist of species in which the fruits are syncarpous; the carpels are connate to various degrees, from a slight basal cohesion to a complete union.

On the basis of the characters mentioned, as well as a number of rather intangible ones, it seems apparent that both *Pelea fulva* and *P. lielaensis* are referable to *Melicope*. But in any event, *Melicope* has priority (1776). There follow the necessary nomenclatural adjustments, and newly drawn descriptions of both species.

1. **Melicope fulva** (Guillaumin) Stone, *nov. comb.* (Pl. 1).

Basionym : *Pelea fulva* Guillaumin, Bull. Soc. Bot. France **85 :** 302 (1938).

6. Stone, in Degeners' Flora Hawaiiensis : Rutaceae : Pelea. (1960).



Pl. I. — *Melicope fulva*. A. Leaf. B. Diagram of one half of an inflorescence; a few axes removed for clarity, and the pubescence not shown. C, D. Flowers. E. Sepal; inset area enlarged in F. G. Petal. H. Fertile stamen. I. Sterile stamen. J. Anther, dorsal side. K. Ovary. L. The same, from above. M. Stigmas, enlarged.

A shrub or tree; with woody branchlets with a slightly suberose pale bark with conspicuous leaf-scars; the entire plant tomentellous with golden-brown trichomes 0.2 — 0.4 mm long, dense and subappressed on all juvenile parts except the upper surface of the leaf-blades, becoming suberect and more or less persistent, but the older branchlets glabrate. Leaves opposite, petiolate, the petiole subterete, tomentellous throughout, 1 — 2.5 cm long; blade simple, entire, obovate to subspathulate, with an abruptly acuminate apex, 8 — 19 cm long, 3.5 — 6.5 cm wide, the apiculate tip 5 — 10 mm long, 3 — 5 mm wide, the costa strongly prominent beneath, densely tomentellous, above sulcate and glabrous; lateral veins 9-12 per side, prominent beneath and tomentellous, slightly raised above and glabrous, paler below (buff-colored), green above, arcuately ascending to within 2-4 mm of the margin, then incurved, uniting with the next vein; veinlets raised beneath, pale, tomentellous, above green and glabrous, anastomosing freely; laminar surface minutely tomentellous beneath, glabrous above. *Inflorescence* cymose-paniculate, all the axes tomentellous, the major peduncle 2 — 3 cm long, extended into a 4- to 5-nodose rachis bibracteate at each node witb opposed cymose panicles up to 3 cm long, the upper branches shorter progressively; the panicle bearing up to 150 to 200 flowers; its dimensions 7 — 9 × 5 — 7 cm as a whole; position axillary among the leaves. Bractlets lanceolate, tomentellous, up to 2 mm long. Flowers externally tomentellous (on both sepals and petals); perianth parts and filaments (and dorsal side of anthers) punctate, when dry (and boiled) translucent, with numerous internal whitish globules; sepals 4, imbricate in pairs, ovate, about 2.3 × 1.5 mm, slightly shorter than the petals, marginally sparsely and minutely ciliate, glabrous within, 3-nerved; petals 4, valvate, approximate at the thickened apices in bud, patent at anthesis, slightly obovate and minutely acuminate, glabrous within, about 3 × 1.5 mm; stamens 8, in two quartets, the longer ones opposite the sepals, fertile, with narrowly deltoid-ligulate lilaments 1.4 mm long, the versatile oblong-orbicular anther about 0.7 × 0.7 mm, punctate dorsally as the filament; sterile shorter stamens opposite the petals, 0.5 — 0.6 mm long, on ligulate filaments with numerous marginal trichomes, abortive anthers 0.2 mm long. Ovary on an obsoletely 8-lobed platform-like glabrous apparently pinkish disk, four-lobed, densely tomentellous with ascending trichomes, subpyramidal, about 1 × 1 mm, the stigmas sessile, of 4 bright magenta deltoid thickish lobes 0.4 — 0.5 mm long united basally, glabrous, not papillate. Fruit not seen.

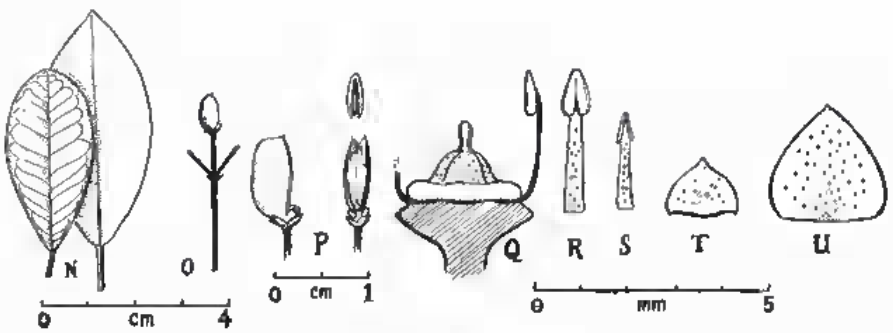
Holotype : New Caledonia; Mt. Arago, in 1868-72, *Balansa* 1797.

Isotypes examined : Kew; Paris.

2. **Melicope tietaensis** (Guillaumin) Stone, *nov. comb.* (Pl. 2).

Basionym: *Pelea tietaensis* Guillaumin, l. c. p. 303.

Glabrous throughout; leaves opposite, simple, the blade elliptic to slightly obovate, acute at both ends or rounded at apex, 2 — 6 cm long,



Pl. 2. — *Melicope lietaensis* : N. Leaves. O. Cyme. P. Three views of a follicle. Q. Diagrammatic view of ovary. R. Fertile stamen. S. Sterile stamen. T. Sepal. U. Petal.

1.5 — 3 cm wide; petiole 5 — 10 mm long. *Inflorescence* axillary, cymose. 3-flowered, glabrous, the peduncle 1.3 — 2 cm long, the pedicels 5 — 10 mm long; flowers glabrous, the sepals broad, acuminulate, 1 mm high; petals deltoid-ovate, 2.5 mm high, slightly broader than high; perianth parts, filaments, and ovary all translucent-punctate. Stamens in two quartets, the taller series 3 mm long, apparently fertile, the shorter series 2 mm long, apparently sterile; disk broad, 8-lobed, reddish; ovary apocarpous, 4-carpellate, the styles coalescent, the stigma erect, blunt. Fruit apocarpous, follicular, subtended by the persistent sepals, each follicle at maturity about 8 mm long, 4 — 5 mm high, subcompressed, glabrous, oblong, minutely apiculate at the apex by the stylar remnant, incurved at the base on the dorsal side, dehiscent along the ventral suture; endocarp glabrous. Seeds not seen.

Holotype: NEW CALEDONIA: *Vieillard* 2466. Isotype seen: PARIS.

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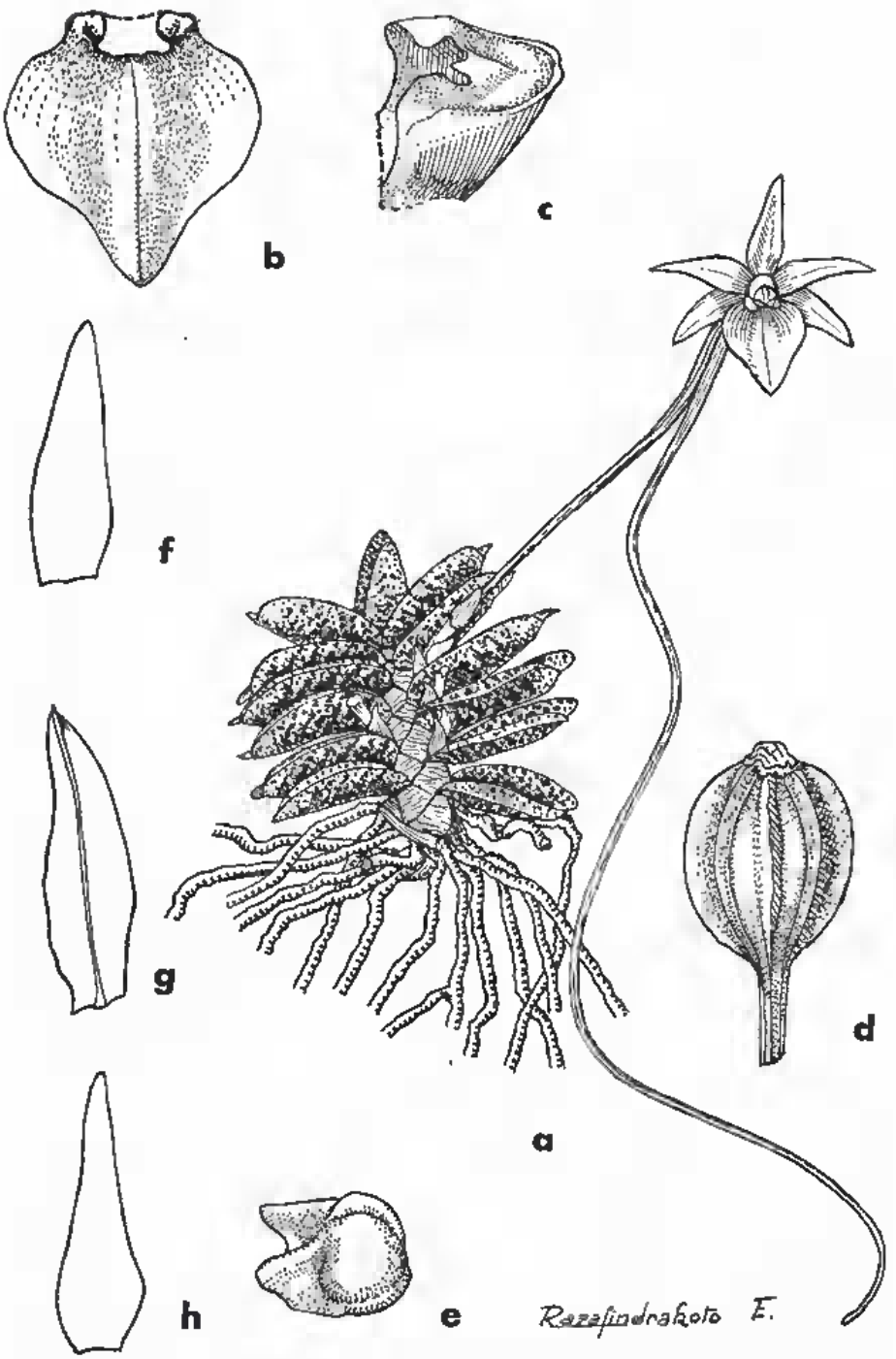
Recently Dr. Otto Degener realized that a Hawaiian plant passing under the name of *Claoxylon Remyi* was not a member of the Euphorbiaceous genus *Claoxylon* but appeared to represent a species of *Platydesma*, an endemic Hawaiian genus of Rutaceae. When Dr. Degener brought this to my attention, I was able to show that this "Claoxylon" was the plant which Hillebrand discussed under *Platydesma auriculaefolia* [7].

Hillebrand, believing that his species and that which Asa Gray had described as *Pelea auriculaefolia* (1854) were the same, applied Gray's specific epithet, transferring it to the genus *Platydesma*. Gray's species is however a true *Pelea*, while the plant which Hillebrand had collected was indeed a *Platydesma*. Rock recognized this fact, and named the taxon as a variety of *P. campanulata*, var. *sessilifolia* [8]. Recently I have

7. Flora of the Hawaiian Islands, 72 (1888).
8. Rock, J. F. 1913. The Indigenous Trees of the Hawaiian Islands, 243.

had the opportunity of examining Hillebrand's original collections, and they match well with the description of *Claoxylon Remyi*, and with an illustration of the type which was supplied by Dr. Degener. This is a specimen collected by Jules Rémy in Hawaii in 1851-55; it had been taken for a *Claoxylon* by Baillon, whose manuscript name was printed in Drake del Castillo's "Illustrationes florae insularum maris Pacifici[9]". When E. E. Sherff, who treated the Hawaiian Euphorbiaceae, published a synopsis of *Claoxylon* in Hawaii[10], he apparently relied on Baillon's determination, but renamed the plant *C. Remyi*, and gave it a full description. The Remy specimen is not in flower, but bears fruit; the capsules are perhaps reminiscent of fruits of *Claoxylon*, but it is without doubt a *Platydesma*. This is now known as *Platydesma Remyi* (Sherff) Deg., Sherff & Stone, and is described and illustrated in Degener's Flora Hawaiiensis. The holotype is *Rémy* 604, collected on the Island of Hawaii, and preserved in the herbarium of the Museum d'Histoire Naturelle of Paris.

9. Ill. fl. ins. mar. Pac. 291 (1892), *nom. nud.*, « *Claoxylon insigne* H. Bn. ».
10. Field Mus. Bot ser. **17** [6] : 557 (1939).



Pl. 1. — *Angraecum Urschianum n. sp. a*, Port × 1; *b*, Labelle × 2; *c*, colonne × 6; *d*, Capsule × 2; *e*, Anthère × 5; *f*, Sépale médian × 2; *g*, Sépale latéral × 2; *h*, Pétale × 2.